

29 DEC 1976

MEMORANDUM FOR: Chief, Real Estate and Construction Division, OL

STATINTL FROM : [REDACTED]
OL Project SAFE Coordinator
VIA : Chief, Headquarters Engineering Branch, RECD/OL
SUBJECT : Facilities Requirements for Project SAFE

1. Included in the Congressional approval of the Agency's FY 77 budget was a funding sequence for Project SAFE, which includes \$1,000,000 in FY 77 and \$2,500,000 in FY 78 for facilities-related projects. Thus, on 1 October 1976 the project clock started with a program requirement for the initial phase of the computer center to be available by July 1978. This report attempts to address the many variables which will affect the Office of Logistics' (OL) ability to meet the various dates for facilities required to support this new computer center. This report presumes that the prospectus question, currently being discussed between the General Services Administration (GSA) and this Agency, will not apply because the 2-year delay in seeking Congressional prospectus approval is totally unacceptable in meeting the goals of Project SAFE. In addition, while not yet determined, the question of this Agency's design authority for construction activities related to Agency-unique programs will simply be addressed in the action plan by inclusion of the 8- to 9-month Architect and Engineer (A&E) selection process normally required by GSA.

2. In selecting potential alternate SAFE sites, technical requirements have been given highest consideration. Additionally, because of the time constraints in achieving the SAFE goals, construction of new buildings or Headquarters Building additions have been considered as impractical. Thus, existing space within the Headquarters Building is considered the most practical solution for location of SAFE facilities. As both A Vault and the newly-expanded B Vault will not have sufficient electrical capacity to support any new major program beyond the ongoing Office of Data Processing (ODP) expansion program, potential location on the south side of the building is not possible. The relative location of the majority of DDI analysts tend to suggest and support the aforementioned utilities dictation of a north side location. Additionally, the potential hazards of major common disaster, such as fire, flooding due to broken pipes, or intentional sabotage, would further support the separation of this Agency's major computer facilities.

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3. Due to floor slab to ceiling slab height considerations required for a raised floor process cooling plenum and suspended ceiling, floors 2 through 7 were dropped from further consideration. Further, the narrow aspect of the width of space on floors 2 through 7 tend to make a given amount of space on these floors longer. This presents technical problems in computer signal processing due to excessive connecting cable lengths. Thus, by process of elimination, it is the ground and first floors of the Headquarters Building on the north side that are being considered.

4. Particular location within these areas is determined again upon electrical power availability, i.e., selection of either C or D Vaults from which to distribute power to Project SAFE. Several years ago, in order to provide adequate power for growth in the northeast quadrant of the Headquarters Building, the Headquarters Engineering Branch (HEB)/RECD/OL contracted for the design for expansion of the C Vault to support a general office growth. Such a typical growth manifests itself in the gradual acceleration in the use of minicomputers, data terminals, and other machine additions within the general office and analytical areas. This design has been completed and the \$700,000 for construction was included in the FY 77 RECD Budget. In general, the original forecast of Project SAFE expenditures presumed, at a minimum, availability of the majority of these funds to provide an electrical distribution function to power SAFE equipment. In considering the choice between C and D Vaults, time considerations clearly support the use of C Vault. The C Vault expansion design, which was based on a general office distribution network (that is to say many secondary circuits carrying light loads), will have to be modified to provide the relatively few, but major circuits, needed to support the heavy concentrated loads of a major computer center. Redesign can be completed in approximately 2 months. An original design for D Vault would require an additional 4 to 6 months to complete. (Note: Should other considerations dictate a D Vault selection, C Vault would still have to be expanded to support the existing pattern of electrical load growth in that quadrant of the building requiring a duplicate construction effort costing approximately \$700,000).

5. Thus, the potential SAFE site locations are in the northeast quadrant of the Headquarters Building on the ground and first floors. The major considerations for specific location within this area are relative closeness to the Transformer Vault C, relatively nearest to ground floor ongraded space to support the weight of the required 60 and 415 Hz Uninterruptible Power Supply (UPS) systems, availability of data grid risers, maintenance of existing major fire egress and circulation corridors, and the obvious necessity of maintaining fixed elevators, toilet facilities, and other existing specialized facilities.

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6. The center will house a new dedicated computer system for information storage and retrieval. Ongoing systems engineering will develop software and hardware configurations to meet specific functional requirements. One potential configuration would utilize four large main frame computers with specified peripherals, six front-end controllers, 50 minicomputers and 75 disk storage units. Such a system with appropriate service areas would require approximately 20,000 sq. ft. excluding supporting utilities (i.e., UPS systems located within the Headquarters Building). In order to preserve maximum flexibility of resources and to avoid overbuilding should a decentralized system be implemented (i.e., minicomputers distributed throughout user areas), it is recommended that a two-phase construction sequence be used. The initial phase would consist of 10,000 sq. ft. of environmentally-controlled computer space, and 3,000 sq. ft. of site preparation for both 60 and 415 Hz UPS systems.

7. For the purposes of this report, specific solutions for the relocation of the various offices and facilities displaced or the subsequent move sequences have not been addressed. Ultimately, approximately 25,000 sq. ft. of yet to be identified new space, addressing only this SAFE requirement, must be provided outside of the Headquarters Building complex. Fifteen thousand sq. ft. of this space must be available by January 1978 to complement a 6-month construction schedule to meet the mid-year 1978 SAFE goal. At this time, it is impossible even to speculate the length of time required by GSA to make such space available. A current requirement for approximately 80,000 to 100,000 sq. ft. of new space for this Agency within the Metropolitan Washington area has recently been resubmitted. Availability of such space is complicated by the GSA burden of filling the Buzzards Point facility, the relative priority that our new space requirement has relative to other Government needs within the GSA Region 3, and the availability of GSA space acquisition funding.

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8. The assessment of the total length of time to complete renovations within the identified "relocation" building is complicated further by the fact that the building selected itself bears heavily on the amount of renovation and preparation required to make it "Agency" liveable. The first floor of [redacted] Building is a most desirable additional new space not only because it would consolidate Agency occupancy of that compound, but also because peripheral support services, such as guard service, secure telephones, shuttle, and courier services already exist. Upwards of 12 to 15 months may be required if an entirely new building is chosen. On the premise that [redacted] is selected, approximately 6 months would be required for renovation of this space following the satisfactory relocation of the [redacted] and [redacted] facilities to a new site (this presumes ongoing renovation design while [redacted] is in the relocation sequence). Obviously, it is this entire aspect of newly-acquired space availability that will ultimately dictate the timing of preparation of the SAFE computer center, utilities, and supporting office space.

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9. For a project of this magnitude and complexity, it will be necessary to provide outside A&E design resources to meet project goals and avoid serious detriment to other ongoing Architectural Design Staff/LSD/OL or HEB projects. The initial GSA projection of a normal GSA-administered design cycle would have the construction contract being awarded in July - August 1978 (20 months). This is in direct conflict with the completion date required for the first phase of the SAFE center. The significant time in this GSA sequence is an 8-to 9-month period required to select an A&E firm through a totally open selection process. Subsequently, however, Mr. James Stewart, Chief, Construction Management Division, GSA, has indicated that GSA can meet the July 1978 goal proving space is available.

10. Preliminary selection of various site locations have been made on the basis of yielding 20,000 to 25,000 sq. ft. These sites have been further refined with Project SAFE personnel by considering the geometry of the available areas as it will directly relate to the technical problems of cable length and equipment layout. The one-floor configuration has been described as the most desirable because it minimizes the problems of manpower staffing, operation, and difficulty of control within a remote area. Operational problems have occurred in the 1D-16 area, which is stacked over the GC-03 center and used in an unmanned mode during evening hours. Equipment failures have gone unnoticed and additional time is necessarily lost in the movement of operating or contract service personnel from GC-03 to 1D-16.

11. The attached building layout drawings are annotated to define six major site variations which have been selected. It should be noted that the single floor schemes have various configurations to provide more or less space; however, these are not presented as they only complicate the basic presentation. No attempt has been made to differentiate the renovation cost difference between these alternatives. They all bear the general similarity of Agency office space, and, at this time, no gross renovation cost differences are apparent.

12. The major utilities support required are similar to those provided in the ODP expansion. The inherent value of filtered, stable, and reliable power to the operation of complex computer equipment is alone worth the cost of installation of the 60 and 415 UPS systems. Emergency operation for the 15 minutes of the battery life is an additional benefit beyond the day-to-day stability of power. The relative needs and merits of providing a third 2500 kW generator as compared to providing a complex load-shedding network are part of an ongoing Real Estate and Construction Division (RECD)/OL review. At this point the cost of providing the third generator can be accurately forecast whereas the cost of an adequate load-shedding system can only be identified after completion of the ongoing engineering study. The dedicated electric power and data grids connecting the computer center and the potential [redacted]

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SAFE console users will gradually grow over the 5 years implementation plan to its maximum configuration. As a result, estimated costs tend to vary widely because of the lack of information. The need of a hardened security shell around the user areas has not yet been finalized; consequently, costs to be attributed to user office modifications are also considered too variable to attempt to identify. The worst case would be the need to entirely contain clustered SAFE users in a special purpose vault requiring alarms, fire sprinklers, and isolation from telephones. From the start, it has been recognized that SAFE will be a crisis management-type system and will require not only dedicated circuitry, but fully-available emergency backup electrical power.

PROJECT SAFE COST ESTIMATES

a. Northside Computer Center and service areas	\$75.00 per sq. ft.	\$1,500,000
b. UPS Systems:		
60 Hz - 1500 kVA and 415 Hz - 300 kVA	{	Hardware Installation
		600,000 200,000
c. Third 2500 kW Generator	Hardware	400,000
	Installation	350,000
d. Data Grid	200,000 to 300,000	
e. Dedicated Electric Power Distribution Grid	200,000 to 300,000	
f. User area renovations		Unknown

NOTE: At this time the Project ADSTAR microform production storage and retrieval systems have not been defined as to their interrelationship with Project SAFE. In general terms, approximately 3,000 sq. ft. of highly-specialized microform production, storage, and retrieval facilities will be required. It is believed that Project ADSTAR has been separately and distinctly funded in FY 78.

13. RECD is recommending against installation of additional regional supplementary chillers, such as the Carriers and Dunham/Bush, in favor of the use

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of the installed redundant capacity at the Powerplant. Operated in this mode, the Powerplant chillers would be directly powered by the Powerplant emergency generators (two 2500 kW generators and two 2000 kW generators). The fundamental rationale behind this decision is the general inability of GSA to maintain these various regional chiller installations for instant readiness, and the resultant elimination of need for yet another major chiller facility to serve the backup requirements on the north side of the building. Such a 700 to 1000 ton chiller installation adjacent to the Headquarters Building would cost upwards of \$1,000,000. Implementing this philosophy will require the completion of various connecting piping systems. In particular, it is necessary for GSA to fund and complete the installation of a redundant supply and return pipeline connecting the Powerhouse and the main building. This will avoid the obvious weak link of a single pipe failure, which would cause the entire building including special-use facilities to lose chilled water. In addition, alternate piping routes between the south and north sides of the building will have to be completed to permit isolation of local piping failures.

14. To summarize, the interdependencies of space acquisition variables and specific facilities forecasts have been pictorially presented on the attached bar graph. Certainly, some of these time estimates may be in error; however, it is considered a good overall prospective.

STATINTL 15. Mr. [redacted] Chief, Special Projects Staff, ODP, has stated that this project is of major importance to the Agency and any significant deterioration of the July 1978 first phase completion would result in serious delay of the system development. Major target dates for systems contractors will center around availability of these Agency facilities for systems integration and validation testing. GSA has stated the July 1978 date can be met; however, based on the complexity and timing of this effort and recent GSA performance on several projects, it will be necessary to expend an inordinate amount of time coordinating with them to ensure timely completion.

16. The overall timing of some of the subutility packages may be somewhat more flexible than the initial 10,000 sq. ft. increment of computer center. On "Day 1" bulk available power must be available to the center, however, there is a margin of 2 to 3 months where the regulated and filtered power of a UPS system is not required. However, beyond this margin it is desirable to have reliable, stable power available in order to avoid physical damage to the initial equipment involved in systems development. Obviously, in this initial period total emergency power will not be required. Similarly, user system may start out with relatively few terminals being supported in the user areas or perhaps within the SAFE center itself. The supporting electrical power distribution and data grid will likewise be in its infancy. However, in the months that follow, it is envisioned that these facilities will be expanding

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in a relatively rapid fashion. The exact program of the 5-year system development and implementation cycle mainly affects the modification of user/analyst areas, the expansion of the dedicated electrical power distribution and development and extension of new data grids.

17. In conclusion, the major variables which will affect completion of this project are:

- a. The availability and timing of new space acquisition.
- b. The specific location of relocation space.
- c. Determination of Agency Components to be displaced.

18. It is recommended that prime consideration be given to a one-floor computer center location and that the final location determination process be initiated as soon as possible. Concurrently, a major effort should be initiated soonest to work with GSA to identify and secure at least 15,000 sq. ft. (including UPS) for relocation and staging area in order that Project SAFE may proceed in an orderly fashion. Maximum flexibility of the facility funding of \$3,500,000 should be kept to provide sufficient contingency for the uncertainty as to the overall cost of the system.

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cc: Mr. [redacted] SPS/ODP
cc: Mr. [redacted] C/LSD/OL

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